



2002 ACE PLAN

Aviation Capacity Enhancement Plan



U.S. Department of Transportation
Federal Aviation Administration

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Aviation Capacity Enhancement Plan

BUILDING CAPACITY TODAY
FOR THE SKIES OF TOMORROW

Federal Aviation Administration
Office of System Capacity

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In 2002, the most important development affecting aviation activity was the gradual recovery of air traffic after the drop off that resulted from the events of September 11, 2001. At this time, the security and safety of the National Airspace System (NAS) are the immediate concerns of NAS providers and customers. However, the continued expansion of system capacity remains a priority to ensure that the NAS will be well positioned for the eventual recovery of traffic once our nation moves past these uncertain times.

The Aviation Capacity Enhancement (ACE) Plan is published annually by the Federal Aviation Administration's (FAA) Office of System Capacity. It contains a summary of the significant accomplishments of FAA-related programs, technologies, and initiatives affecting the capacity of the NAS. Airports, airlines and aviation organizations use the ACE Plan. Beyond the U.S. and international aviation industry stakeholders, academia and members of the U.S. Congress are also part of its audience.

Introduction – Perspectives on the NAS Recovery

Summarizes the events of the past year and the continuing changes in the NAS. Highlights the priorities of the Operational Evolution Plan (OEP). Provides a timeline of September 11, 2001.

Chapter 1 – Aviation Activity and Capacity in the National Airspace System

Contains a summary of activity by all user groups during the past year and discusses the revised FAA forecasts for aviation activity to FY 2013. Also summarizes recent changes in demand for airport and air traffic services, including the increased use of regional jets and the introduction of new advanced aircraft.

Chapter 2 – National Airspace System Performance

Discusses new measures of the performance of the NAS. Summarizes recent delays and trends in delays.

Chapter 3 – Airport Capacity Analysis and Enhancements

Summarizes capacity analysis projects underway or recently completed. Reports on the demand management solutions in effect at some airports.

Chapter 4 – Airport Development

Provides an overview of new challenges to airport development and an update on airport construction projects and funding sources.

Chapter 5 – Operational Procedures

Provides an update on new and modified operational procedures. Topics include air traffic management during convective weather (the Spring/Summer Plan), reduced separation minima, the development of RNAV approaches, and simultaneous approaches to closely spaced parallel runways.

Chapter 6 – Airspace Redesign

Contains an update on FAA programs to redesign airspace and maximize efficiencies in air traffic flow. Reports on various elements of the National Airspace Redesign Plan, including high-altitude redesign and regional airspace redesign initiatives.

Chapter 7 – National Airspace System Modernization

Contains an overview of the FAA's air traffic control NAS modernization efforts.

These chapters are supported by additional information on aviation activity and construction projects at the busiest 100 U.S. airports in the following appendices:

Appendix A

Describes the basic elements of the National Airspace System.

Appendix B

Provides historical, current and forecast information on passenger enplanements and aircraft operations at the busiest 100 U.S. airports, as ranked by enplanements.

Appendix C

Summarizes the status of the recommendations of completed Capacity Enhancement Plans.

Appendix D

Summarizes runway construction projects that are proposed for 2007 and beyond.

Appendix E

Presents airport layouts with an update of current and proposed capacity enhancement projects.

Appendix F

Defines acronyms used in the ACE Plan.

Appendix G

Provides definitions of important aviation terms and concepts.

Appendix H

Lists the references used to prepare the ACE Plan and credits materials from FAA and other sources.

About the Data

The 2002 ACE Plan contains data for both calendar year (CY) 2001 and fiscal year (FY), October 1 – September 30, 2001. Since FAA forecasts are available only for fiscal years, all data relating to those forecasts are for fiscal years. Other data, such as delays, are presented for relevant calendar years. Appendices B and C provide comparative data for the last 3 fiscal and calendar years.

While the events of September 11 did negatively impact traffic in FY 2001, the greatest impact is expected to occur during the fourth quarter of calendar year 2001, which is also the first quarter of FY 2002. Normally these data comparisons vary only slightly. However, there will be relatively large differences between the fiscal and calendar year growth rates as reported in 2001 and 2002. Final analysis of this data will be released in 2003. This year, enplanements and operations for the individual airports contained in Appendix E are given for the most recent calendar year.



INTRODUCTION

Perspectives On NAS Recovery

The nation's aviation priorities quickly moved from concerns about air traffic congestion and delays to implementing tighter security measures at airports following the events of September 11. Overall, air traffic has declined 2-3 percent during the past year. By mid-2002, the uneven resurgence in air travel brought the need for enhanced system capacity back into the limelight and efforts to increase system capacity must continue, since it is key to the long vitality of the aviation industry.

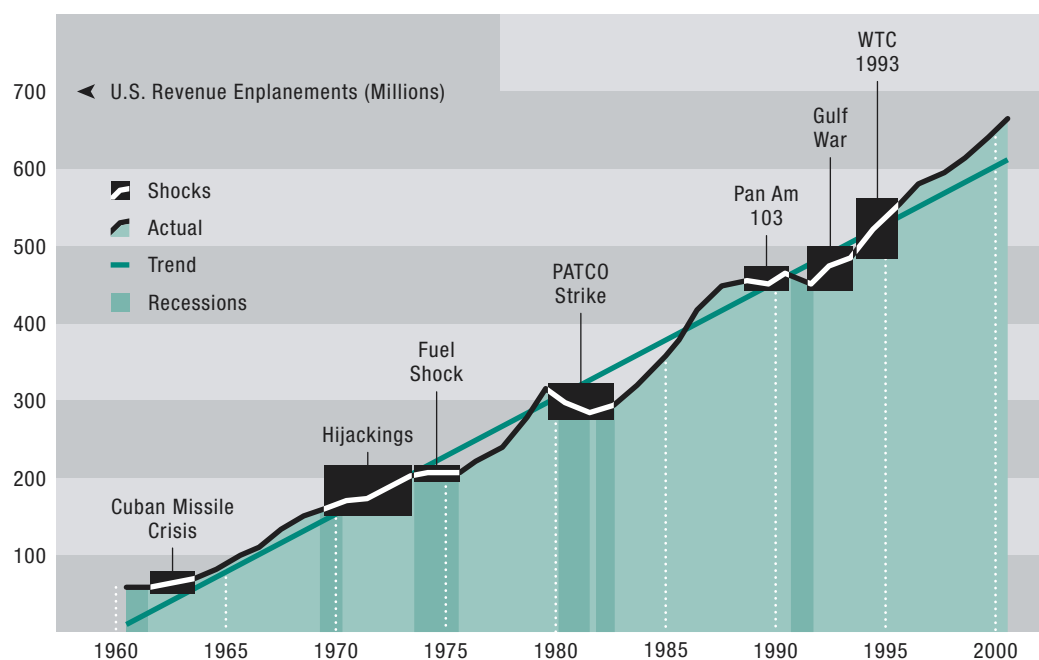
The ACE Plan is an annual synopsis of the FAA's efforts to help improve the efficiency of the aerospace system. The goal of these efforts is to increase the percentage of flights that arrive on time, improve airport capacity, and enhance the efficiency of the nation's aviation system.

The Cyclical Nature of the Industry

Air traffic continues to recover at an uneven pace as geography and national demographics redefine demand and accelerate the challenges to higher-demand air traffic flow regions. For example, traffic has recovered in the Midwest more quickly than it has on the East and West coasts. Furthermore, airlines are increasing the use of smaller aircraft such as regional jets, adding to an already complex air traffic management system.

The aviation industry historically adjusts to changing passenger traffic and freight demands by seeking to improve service and operating efficiency. In the past year their efforts include: readjustments of flight schedules, matching aircraft size to market demand, converting some mainline service to regional operators, increasing flight frequencies in key markets, cutting operational costs, and offering attractive price incentives. While flight operations at some airports are recovering at a faster rate than enplanements, airline revenues are expected to lag as the industry implements these strategies. Yet passenger traffic and the number of flights have been gradually increasing and the long-term forecast for the U.S. aviation industry is an upturn that will result in system-wide traffic returning to pre-September 11 levels in 2004. For this reason, it's critical that the focus of the aviation industry must include investments for long-term recovery.

During this temporary, economic downturn it's important to remember that the financial state of the airline industry will have an impact on the funding that is available for capital improvements in the aviation infrastructure. The tendency has been, and is, to delay some airport development projects; to put some on hold indefinitely; and to withdraw airline financial support from some projects. Therefore, it is essential to understand that the capacity of the national airspace system remains a key component to the long-term vitality of the U.S. economy. The FAA is committed to supporting construction of new runways and other airfield improvements that will be needed when air traffic levels recover. Through the provisions of airport grants and Passenger Facility Charge (PFC) approvals, procedure development, and equipment modernization, the FAA is working with the industry to ensure that the aviation system capacity keeps pace with air travel demand. The following figure provides a historical perspective of air traffic recovery following political and economic shocks over the past 40 years.

Figure I-1 Aviation System Shocks and Recoveries

"The 60's led with the Cuban Missile Crisis while the 70's introduced aircraft hijackings with subsequent effects on international aviation demand in particular. The 80's opened with the PATCO strike, while the Persian Gulf War created temporary travel uncertainty in the early 90's. The new millennium brings us a new war against worldwide terrorism that presents a unique set of uncertainties."¹

Event And Recovery Timelines

Prior to September 11, 2001, the NAS handled 1.9 million passengers, traveling on 60 thousand flights, daily. On that day—the skillful actions of the FAA's air traffic controllers, working in unison with airline, military, and government personnel, safely landed 4,500 aircraft carrying 350,000 passengers and crew in a period of approximately one and a half hours. More than 1,100 flights were rerouted in the first 15 minutes after the order to land was issued—more than one aircraft every second. The events of this day continue to have a rippling effect on air traffic demand in the NAS. The following timeline summarizes the sequence of events on September 11 to shutdown the air traffic system, followed by the key milestones of air traffic system recovery.

¹ Aviation System Shocks and Recoveries: "History favors optimism, opportunities in light of tragic events," by James G. Walsh, Landrum & Brown, for ATA.

September 11, 2001*Chronology of Events on September 11, 2001***0800.**

American Airlines Flight 11, a Boeing 767 with 92 people on board, takes off from Boston Logan Airport for Los Angeles.

0814.

United Airlines Flight 175, a Boeing 767 with 65 people on board, takes off from Boston Logan airport for Los Angeles.

0821.

American Airlines Flight 77, a Boeing 757 with 64 people on board, takes off from Washington Dulles airport for Los Angeles.

0840.

FAA notifies the North American Aerospace Defense Command's (NORAD) Northeast Air Defense Sector about the suspected hijacking of American Flight 11.

0841.

United Airlines Flight 93, a Boeing 757 with 44 people on board, takes off from Newark airport for San Francisco.

0843.

FAA notifies NORAD's Northeast Air Defense sector about the suspected hijacking of United Flight 175.

0846.

Approximately. American Flight 11 crashes into the north tower of the World Trade Center.

0902

Approximately. United Flight 175 crashes into the south tower of the World Trade Center.

0904.

Approximately. The FAA's Boston Air Route Traffic Control Center stops all departures from airports in its jurisdiction (New England and eastern New York State).

0906.

The FAA bans takeoffs of all flights bound to or through airspace of New York Center from airports in that Center and three adjacent Centers—Boston, Cleveland and Washington. This is referred to as a First Tier ground stop and covers the Northeast from North Carolina north and as far as west as eastern Michigan.

0908.

The FAA bans all takeoffs nationwide for flights going to or through New York Center airspace.

0924.

The FAA notifies NORAD's Northeast Air Defense Sector about the suspected hijacking of American Flight 77. The FAA and NORAD establish an open line to discuss American 77 and United 93.

0926.

The FAA bans takeoffs of all civilian aircraft regardless of destination—a national ground stop.

0940.

Approximately. American Flight 77 crashes into the Pentagon.

0945.

In the first unplanned shutdown of U.S. airspace, the FAA orders all aircraft to land at the nearest airport as soon as practical. At this time, there were more than 4,500 aircraft on Instrument Flight Rules (IFR) flight plans.

1007.

Approximately. United Flight 93 crashes in Stony Creek Township, PA.

1039.

Reaffirming an earlier order, the FAA issues a Notice to Airmen (NOTAM) that halts takeoffs and landings at all airports.

1215.

Approximately. The airspace over the 48 contiguous states is clear of all commercial and private flights.

Notes:

All times is Eastern Daylight. For UTC/Zulu/GMT, add four hours.

Flight departures are actual takeoff times, not scheduled or gate departure times.²

September 13

Most U.S. airports reopen after meeting new security requirements, Boston and Reagan National remain closed and general aviation activity is limited.

September 14

General Aviation Instrument Flight Rule (IFR) flights are allowed with restrictions, but cannot operate within 25 nautical miles of DCA or JFK.

September 15

Boston reopens.

² Federal Aviation Administration August 12, 2002 press release "Chronology of Events on September 11, 2001."

September 19

Limited return of general aviation, for Part 91 Visual Flight Rule (VFR) flights within Enhanced Class B airspace, which is the area within 40 to 50 miles of the nations most heavily, used airports.

October 1

The Federal Aviation Administration steps in and issues 80 war risk insurance policies to carriers on a temporary basis when commercial insurance markets cancel coverage.

October 4

Washington Reagan National Airport reopens to limited commercial air service, and no general aviation traffic is allowed.

November 19

President Bush signs the Aviation and Transportation Security Act, which establishes a new agency to handle airport security, the Transportation Security Administration (TSA).

February 17, 2002

Responsibility for airport security was transferred from U.S. airlines to the federal government, which includes responsibilities for screening luggage and passengers, as well as hiring permanent staff to facilitate new security measures.

April 24

Reagan National now operates with most restrictions lifted, while general aviation traffic is still prohibited.

September 11

The US National Airspace System carries 188,873 operations, compared to 36,340 operations when the airspace was shut down on September 11, 2001.

**Operational Evolution Plan (OEP): Achievements, Planning
Adjustments and Communications Progress**

The OEP is a detailed 10-year plan for more than 100 separate programs to support modernization and increase the capacity and efficiency of the national airspace system while maintaining safety and security. The OEP is periodically modified to reflect new innovations and emerging technologies that could improve the movement of air traffic, and/or increase NAS capacity. The airlines, airports and other members of the aviation community shared in the development of the OEP and continue to play an active role in its evolution. As demand continues to return, the OEP stays its course to build an aviation system for the 21st century that is responsive to adjusted forecasts of demand. At the same time, the OEP is also taking into account the current economic climate and working with aviation community stakeholders to better plan investment decisions, solve problems and advance new technologies. Solutions are being proposed in four critical areas: Arrival and Departure Rates, En Route Congestion, Airport Weather, and En Route Severe Weather. Important OEP initiatives include:

- The plans for new runways at 12 airports, which will provide a significant increase in capacity.
- Support from the users, who must make significant investments in avionics equipment and pilot training to take advantage of the implementation of new technologies.
- Efforts by the FAA, working with National Aeronautics and Space Administration (NASA) and the Department of Defense (DoD), to undertake research and development of new air traffic management technologies, advanced air traffic control support tools, improved training efficiency and enhanced safety through human factors research.

Overview of the OEP Quadrants

Arrival and Departure Rates

There are two strategies to help airports meet peak demand: constructing new runways dramatically increase the capacity of any airport but may take up to 10 years to build; maximizing the use of existing runways—allowing new operations, introducing new technologies, or improving airspace design, surface management, air traffic procedures, standards, workload, information exchange and decision support tools.

En Route Congestion

In the en route arena, capacity and efficiency are governed by sectors, separation standards and controller workload. To meet peak demand, capacity can be enhanced in short cycles (adding controllers to sectors, changing the size of sectors) and long cycles (establishing new sectors and new routes). En route congestion quickly ripples into other airspace creating delay for many flights. En route success assures flexibility operations.

Airport Weather

For the benchmark airports, typical bad weather operations lower arrival and departure rates 18 percent compared to good weather. As weather or visibility degrades, runway use may become limited and spacing between aircraft grows. To make airport operations less sensitive to weather, we need more options for runway configurations and more consistent spacing of operations, much of which requires new technologies.

En Route Severe Weather

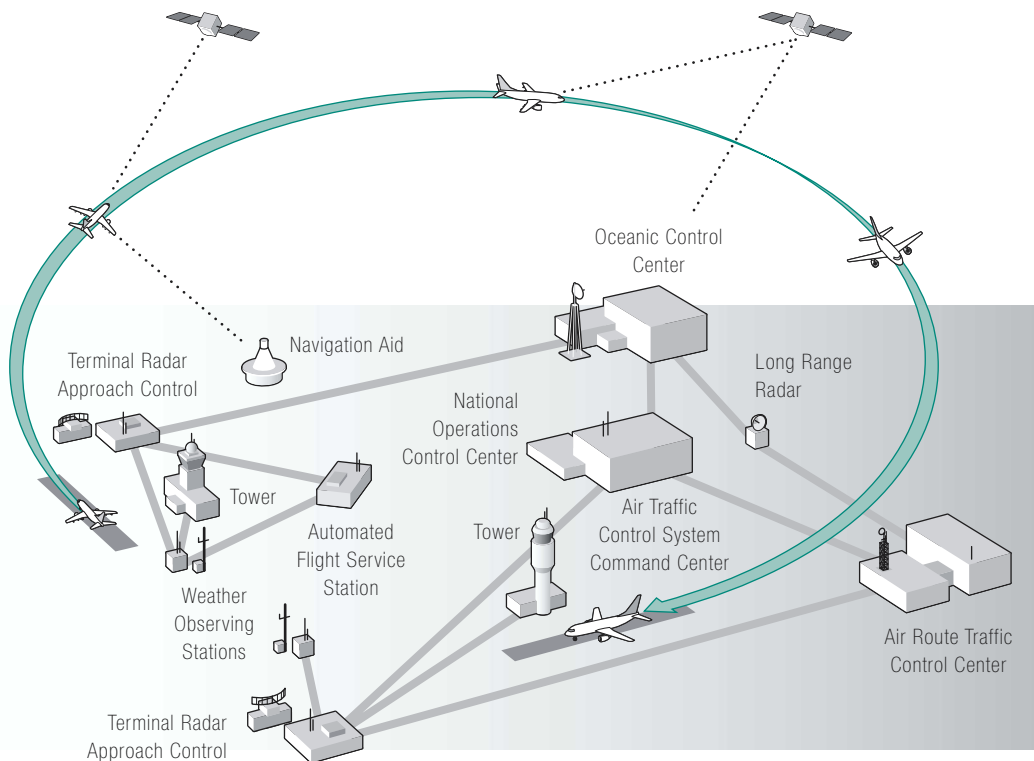
Almost half of our delays and cancellations arise in bad weather, reactions to that weather or the congestion it causes. Improvements will come from improved forecasting, improved sharing of real-time data, and quicker re-configuration of airports, before, during or after severe weather.

Version 5.0 of the NAS Operational Evolution Plan may be accessed on the FAA's Web site, at <http://www.faa.gov/programs/oep>.

2002—A New Era In Aviation Begins

The cover of this year's ACE Plan symbolizes recovery, both the return of air traffic and the renewed confidence of the nation's air travelers. The photographs represent a passenger's experience in traveling through a U.S. airport, depicted in green for economic revitalization, in blue for the vital role of air traffic controllers and pilots governing the skies, and yellow, for the dawn of the new era in aviation. It's been said that jet fuel powers the nation's economic engine. While the faltering economy and events of 2001 caused a staggering stall, indications are that the engine is "re-powering." We look towards a future of recovery and new heights of achievement as we acknowledge the accomplishments from a Centennial of Flight, which will be celebrated in 2003. The following illustration represents the efficient, integrated operations of the National Airspace System.

Figure I-2 Today's National Airspace System



The ACE Plan highlights capacity-related annual accomplishments and performance data of the National Airspace System. The OEP is the 10-year tactical implementation effort that supports the short-, mid- and long-term operations, reflecting the continued collaboration among the FAA, airlines, airports and other major components of the aviation industry. The longer-term outlook is also part of the FAA's perspective, to provide a safe and efficiently operating NAS, able to accommodate increasing air traffic demand without excessive delays.

The Vision

In the future airspace system, reflecting the vision for 2020 and beyond, air travel will be far more reliable and flexible than it is today. At the core of the future airspace system are state-of-the-art decision support tools that improve situation awareness in all aspects of flight. As for the future vision of the infrastructure, airports will have new capabilities as well. Along with new runways at the most constrained locations, more airports will be equipped to handle more air traffic in more difficult kinds of weather, removing the restrictions of pre-defined route structures. Improved operations at parallel runways, even in degraded weather, and improved procedures at airports without new runways, are also essential to capacity growth.³

3 *Future Concept of Operations*, published by the RTCA, www.jupiteralignedwithmars.com

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